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10/599,539	08/09/2007	Shuichi Fujii	81872.0127	1506

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EXAMINER	
BOURKE, ALLISON	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,539	FUJII ET AL.	
	Examiner	Art Unit	
	Allison Bourke	4133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/29/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 11 is objected to because of the following informalities: the area of the contact surface represented by S_2 is not described in the relationship. For examination purposes S_2 was interrupted to be not part of claim 11. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The term "a great number" in claim 6 is a relative term which renders the claim indefinite. The term "a great number" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For examination purposes "a great number" of fine irregularities was interrupted to mean the surface was covered with the fine irregularities.

6. The term "generally identical" in claim 18 is a relative term which renders the claim indefinite. The term "generally identical" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For examination purposes "generally identical" was interrupted to mean identical.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 3-4 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimine et al. (US 2005/0199279) in view of Murakami (US 5,380,371).

Regarding claim 1, Yoshimine discloses a solar cell module comprising:

- a translucent panel (14 in Fig. 2)
- a back surface protective member (15 in Fig. 2)
- a plurality of sheet-like solar cell elements that are arranged between the translucent panel and the back surface protective member and electrically connected to one another (1 in Fig. 2)
- a filler member for filling spaces between the solar cell elements (13 in Fig. 2)
- wherein a surface electrode is provided on light receiving surfaces of the solar cell elements, the surface electrode comprising three bus bar electrodes (not explicitly shown in Yoshimine) for retrieving light-produced electric current generated at the solar cell elements to the outside and power collecting finger electrodes that are connected to the bus bar electrodes (Fig. 1 and [0065])
- the bus bar electrodes have widths of not less than 0.5 mm and not more than 2 mm (specifically 1.5 mm) , and the finger electrodes have widths of not less than 0.05 mm and not more than 0.1 mm (specifically 0.1 mm) [0011]

Yoshimine does not disclose a three bus bar electrode. Murakami teaches a solar cell with three bus bar electrodes (Fig. 1C) and also teaches a great amount of electric current will flow through the bus bar more area is needed, which is accomplished by having three bus bars because the large cross section areas (C9/L8-10).

These references are analogous because both are directed towards silicon solar cells with a translucent panel, back surface member and bus bars and fingers. It would have been obvious to one having ordinary skill in the art at the time of the invention to add an additional bus bar electrode to the solar cell of Yoshimine, to extract the maximum amount of electric current.

Regarding claim 3, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the finger electrodes have widths of not less than 0.06 mm and not more than 0.09 mm. However, Yoshimine teaches a finger width of about 0.1 mm which is very close to the claimed range (MPEP 2144.05 II). As the amount of incident light and contact area of the electrodes are variables that can be modified, among others, by adjusting the finger electrode width, with said incident light increasing as finger electrode width is decrease, the precise finger electrode width would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed finger electrode width cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the finger electrode width in the

apparatus of Yoshimine to obtain the desired balance between the amount of incident light given the contact area of the electrodes to efficiently collect the electric current (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claim 4, modified Yoshimine discloses the finger electrodes are in direct contact with the filler member (1, 13 in Fig. 1 and 2).

Regarding claim 11, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the contact surface is formed by contact between the bus bar electrodes and the semiconductor region, and with the contact surface being planarly viewed from a direction vertical to the light receiving surface, when an entire length of the edge lines is represented by L_2, an area of the contact surface is represented by S_2, and an area of the entire light receiving surface planarly viewed from a direction vertical to the light receiving surface is represented by S_3, the values L_2, S_2, and S_3 satisfy the following relationships: $L_2>5S_3^{1/2}$. As the amount of contact surface area between the bus electrodes and semiconductor region are variables (both dependent upon edge lines and electrode width), that can be modified, among others, by adjusting semiconductor region roughness, with said contact surface area between the bus electrode and semiconductor region increasing as roughness of the semiconductor region is increased, the precise surface roughness would have been considered a result effective

variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed relationship between bus electrode size and surface roughness cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the surface roughness in the apparatus of modified Yoshimine to obtain the desired balance between the amount of contact surface area between the bus electrode and semiconductor region (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claim 12, modified Yoshimine discloses all of the claim limitations as set forth above, in addition to the electrode is desired to be as small as possible because the collector electrode blocks light incident into the solar cell element and may cause to reduce the effective area of the solar cell element. But the reference does not explicitly disclose area of the bus bar electrodes and/or the finger electrodes planarly viewed from a vertical direction on the light receiving surface side is represented by S_a, and a surface area of a region of the light receiving surface of (each of) the solar cell elements where the surface electrode is provided is represented by S_b, the following relationship is satisfied: $1.10 \leq S_b/S_a \leq 2.10$. As the effective area of the solar cell element is a variable that can be modified, among others, by adjusting the electrode surface area, with effective area increasing as electrode area is decreasing, the precise electrode area would have been considered a result effective variable by one having

ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed electrode area cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the electrode area in the apparatus of modified Yoshimine to obtain the desired balance between effective area and the electrode area (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claim 13, modified Yoshimine discloses photovoltaic power generator for extracting electric power by connecting one or a plurality of the solar cell modules [0006].

11. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimine et al. (US 2005/0199279) in view of Murakami (US 5,380,371), as applied to claims 1, 3-4 and 11-13, in further view of Fukawa et al. (US 2004/0200522).

Regarding claim 2, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the shape and size of the solar cell elements. Fukawa teaches 150 mm square multi-crystalline silicon solar cells elements are common [0085].

Modified Yoshimine and Fukawa are analogous because both references are directed toward solar cell elements with a plurality of layers. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a common size and

shape semiconductor for the production of a solar cell element because it would amount to nothing more than a known product for its intended use in a known environment to accomplish entirely expected results.

Regarding claim 5, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the solar cell elements comprise on the light receiving surface side thereof an opposite conductivity-type diffusion layer having a sheet resistance of not less than 60Ω/□ and not more than 300Ω/□. Yoshimine does disclose a n-type layer is formed by diffusing n-type impurities in a thermal diffusion process [0009]. Fukawa discloses placing the semiconductor substrate in a diffusion furnace and heated in phosphorus oxychloride and the like so that phosphorus atoms are diffused into a surface region of the semiconductor substrate to form an n-type diffusion layer with a sheet resistance of about 30-300 Ω/□ [0061]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use this technique because it would amount to nothing more than a known product with a known technique for its intended use in a known environment to accomplish entirely expected results.

12. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimine et al. (US 2005/0199279) in view of Murakami (US 5,380,371), as applied to claim 1, 3-4 and 11-13, in further view of Fujii et al. (US 2003/0178057).

Regarding claim 6, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the light receiving surface

side on thereof a great number of fine irregularities having widths and heights of 2 μm or less and an aspect ratio of 0.1-2.

Fujii (2003) discloses a solar cell wherein the semiconductor substrate is formed with protrusions and recesses on the surface side where the height and width of these irregularities are 2 μm or less and an aspect ratio of 0.1-2 [0057] [0058].

These references are analogous because both are directed towards a solar cell with surface irregularities to optimize the reflectance and to maximize the surface contact of the semiconductor region and the electrode.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use this surface modification technique to optimize the reflectance in order to maximize the indecent light [0007]. Also, it would have been obvious to one of ordinary skill in the art at the time of the invention to use this surface modification technique to maximize the surface area contact between the semiconductor region and the electrode because the contact resistance of the contact area between the electrode and semiconductor region can be reduced.

Regarding claims 7, 8 and 10 modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose

- trajectories drawn by moving edge lines of a contact surface between the bus bar electrodes and/or finger electrodes and the semiconductor region in the direction of an electric current flowing through the bus bar electrodes and/or finger electrodes include in at least a part thereof a region where the direction of a

tangent line of the trajectory is not coincident with the electric current flowing direction.

- the edge lines of the contact surface between the bus bar electrodes and/or finger electrodes and the semiconductor region include a rugged contour
- the profile of the edge lines of the contact surface includes at least a part where the edge lines are asymmetric with respect to a center line of the finger electrode forming the contact surface that runs in the same direction as the direction of electric current flowing through the finger electrode

Fujii (2003) discloses a solar cell wherein the semiconductor substrate is formed with protrusions and recesses on the surface side wherein all the claim limitation above are met (Fig. 1 (1, 4) and Fig. 4 and [0057])

These references are analogous because both are directed towards a solar cell with surface irregularities to maximize the surface contact of the semiconductor region and the electrode.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use this surface modification technique to use this Fujii (2003) surface modification technique to maximize the surface area contact between the semiconductor region and the electrode because the contact resistance of the contact area between the electrode and semiconductor region can be reduced.

Regarding claim 9, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the area of the contact surface between the finger electrodes and the semiconductor region is represented by

S_1, an average value of distances between the edge lines of the contact surface within each cut surface formed by cutting at a plurality of cut planes that are generally perpendicular to the direction of electric current flowing through the finger electrode is represented by d_1, and an entire length of the edge lines is represented by L_1, the solar cell elements each include at least one finger electrode where the values S_1,d_1, and L_1 satisfy the following relationship: $0.5L_1(S_1*d_1^{-1}+d_1)^{-1}> 1.2$. As the amount of contact surface area between the finger electrodes and semiconductor region are variables (both dependent upon edge lines and electrode width), that can be modified, among others, by adjusting semiconductor region roughness, with said contact surface area between the finger electrode and semiconductor region increasing as roughness of the semiconductor region is increased, the precise surface roughness would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed relationship between finger electrode size and surface roughness cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the surface roughness in the apparatus of Yoshimine to obtain the desired balance between the amount of contact surface area between the finger electrode and semiconductor region (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

13. Claims 14-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimine et al. (US 2005/0199279) in view of Fukawa et al. (US 2004/0200522).

Regarding claim 14, Yoshimine discloses a solar cell module comprising:

- a translucent panel (14)
- a back surface protective member (15)
- a plurality of sheet-like solar cell elements that are arranged between the translucent panel and the back surface protective member and electrically connected to one another (1)
- a plurality of wiring members for electrically interconnecting adjacent solar cell elements of the plurality of the solar cell elements (12);

Yoshimine does not disclose:

- connecting members for electrically interconnecting the plurality of wiring members,
- wherein the connecting members are disposed between non-light-receiving surfaces of the solar cell elements and the back surface protective member.

Fukawa discloses connecting members (transverse connection line) for interconnecting wiring members (10 in Fig. 7). Fukawa also discloses the wiring, connecting and wiring members are inside the solar cell module, which would infer between non-light receiving surface and back surface [0107].

These references are analogous because they both disclose a plurality of multilayer solar cell elements connected with wiring. It would have been obvious to one

of ordinary skill in the art at the time of the invention to use connecting members for electrically interconnecting the plurality of wiring members in order to provide for adjustment of longitudinal and transverse dimensions of the solar cell module. Also, it would have been obvious to one of ordinary skill in the art at the time of the invention to place the connecting members between non-light-receiving surfaces of the solar cell elements and the back surface protective member. This is because it would maximize the light effective area and efficiency of the solar cell and would also protect the wiring from the elements with the back protective surface.

Regarding claim 15, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the sum of the areas of the plurality of solar cell elements is not less than 91.9% and not more than 97.7% of an entire area on the light receiving surface side of the solar cell module. As the solar cell cost and efficiency are variables that can be modified, among others, by adjusting said areas of plurality of solar cells elements in relation to light receiving area, with said solar cell cost and efficiency increasing as area of plurality of solar cell elements is decreased, the precise area of plurality of solar cell elements would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed areas of plurality of solar cells elements in relation to light receiving area cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, area of plurality of solar cell elements in the apparatus of Yoshimine to obtain the desired balance between said

solar cell cost and efficiency (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Regarding claim 16, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the shorter distance selected from distances including the shortest distance between an end side of a solar cell element located at the outer most periphery of the plurality of arranged solar cell elements and an end of the perimeter of the solar cell module and the shortest distance between the wiring members or the connecting members and the end of the perimeter of the solar cell module is not less than 5 mm and not more than 11 mm. As the solar cell cost and efficiency are variables that can be modified, among others, by adjusting said distances (thus areas of plurality of solar cells elements in relation to light receiving area), with said solar cell cost and efficiency increasing as area of plurality of solar cell elements is decreased, the precise distances would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed distances cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the distances in the apparatus of Yoshimine to obtain the desired balance between said solar cell cost and efficiency (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art,

discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Regarding claim 17, modified Yoshimine discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the spacing between the plurality of solar cell elements is not less than 70% and not more than 143% of the widths of the wiring members. As the solar cell cost and efficiency are variables that can be modified, among others, by adjusting said spacing (thus areas of plurality of solar cells elements in relation to light receiving area), with said solar cell cost and efficiency increasing as area of plurality of solar cell elements is decreased, the precise spacing would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed spacing cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the spacing in the apparatus of Yoshimine to obtain the desired balance between said solar cell cost and efficiency (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Regarding claim 19, modified Yoshimine discloses all the claim limitations as set forth above, but the reference does not explicitly disclose the widths of the wiring members are not less than 0.8 mm and not more than 2.0 mm.

Fukawa further discloses the width of the wiring members (connection tabs) should be the same as or smaller than the width of the bus bar electrode so as not to cast a shadow of itself on the light-receiving surface of the solar cell element and the widths are to be between 1-3 mm [0101].

These references are analogous because they both disclose a plurality of multilayer solar cell elements connected with wiring. It would have been obvious to one of ordinary skill in the art at the time of the invention to use wiring members with the same or smaller width than the bus bar in the solar cell of Yoshimine, in order to not cast a shadow of itself on the light-receiving surface of the solar cell element.

Regarding claim 20, modified Yoshimine disclose all of the claim limitations as set forth above, and further Yoshimine discloses a photovoltaic power generator for extracting electric power by connecting one or a plurality of the solar cell modules [0006].

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimine et al. (US 2005/0199279) in view of Fukawa et al. (US 2004/0200522), as applied to claims 14-17 and 19-20, in further view of Ralph et al. (US 6,156,967).

Regarding claim 18, modified Yoshimine discloses all of the claim limitations as set forth above, but the references do not explicitly disclose all the widths of the wiring members viewed from the light receiving surface side are generally identical.

Ralph discloses wiring members (interconnectors, 206) as having the same width. These references are analogous because they both disclose a plurality of solar cell elements connected by electrical wires.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use identical widths for the wiring members because it would amount to nothing more than a known product for its intended use in a known environment to accomplish entirely expected results.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allison Bourke whose telephone number is (571)270-1232. The examiner can normally be reached on Monday-Thursday 7:30am-5pm and every other Friday 7:30am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. B./
Examiner, Art Unit 4133

/Barbara L. Gilliam/
Supervisory Patent Examiner, Art Unit 4191